

REMARKS**Status of Claims:**

Claims 1-78 are pending in the application. Each of the pending claims defines an invention that is novel and unobvious over the cited art. Favorable consideration of this case is respectfully requested.

Summary of the Present Invention:

The present invention relates to parallel assembly technologies for fabricating multi-layer electronic interconnect structures having vias only between the layers being connected. The present invention provides that the vias of a first subassembly are electrically and mechanically connected to the circuitry of an adjacent subassembly by means of metallurgical bonds.

Rejections Under 35 U.S.C. § 112, 2nd Paragraph:

Claim 6 was rejected under 35 U.S.C. § 112, 2nd Paragraph, as being indefinite.

The Examiner cited claim 6 as omitting a step. Claim 6 is hereby amended to recite removing a layer of conductive material from one of a top and bottom surface as suggested by the Examiner.

Rejection Under 35 U.S.C. § 102(b):

Claims 1-3, 7-10, 12-14, 16-18, 20-21, 37-42, 45-48, 51-53, and 64-68 were rejected under 35 U.S.C. § 102(b) as being anticipated by Takenouchi (5,744,758).

Rejection under 35 U.S.C. § 102 requires the prior art disclose each and every limitation of the claimed invention (MPEP § 706.02). In determining anticipation, no claim limitation may be ignored. See *Pac-Tex, Inc. v. Amerace Corp.*, 14 USPQ2d 1871 (Fed. Cir. 1990). Anticipation requires the disclosure, in a prior art reference, of each and every recitation as set forth in the claims. See *Titanium Metals Corp. v. Banner*, 227 USPQ 773 (Fed. Cir 1985), *Orthokinetics, Inc. v. Safety Travel Chairs, Inc.*, 1 USPQ2d 1081 (Fed. Cir 1986), and *Akzo N.V. v. U.S. International Trade Commissioner*, 1 USPQ2d 1241 (Fed. Cir 1986). There must be no difference between the claimed invention and reference disclosure for an anticipation rejection under 35 U.S.C. § 102. See *Scripps Clinic and Research Foundation v. Genentech, Inc.*, 18

USPQ2d 1001 (CAFC 1991) and *Studiengesellschaft Kohle GmbH v. Dart Industries*, 220 USPQ 841 (CAFC 1984).

Claims 1, 37, 46, and 66-68 are hereby amended to recite deposition of electrically conductive metallurgical material in the vias. The recitation of "electrically conducting metallurgical material" is incorporated into each of the claims in view of the dependence of the remaining claims on one of the amended claims. Electrically conducting metallurgical material was disclosed in the original specification at page 26, line 9, through page 28 line 17.

The evidentiary record fails to teach each limitation of the present invention in view of the silence of Takenouchi regarding forming metallurgical bonds. The present invention and Takenouchi teach filling vias with conductive paste. However, the present invention further teaches that the prior art comprises various types of conductive pastes, including a first type of paste that is not capable of forming a metallurgical bond and a second type of paste that is capable of forming a metallurgical bond. Takenouchi merely teaches conductive paste bonding and is silent as to the composition of a paste required to form metallurgical bonds. The present invention teaches that the conductive past must comprise particles of metal, fusible at the processing temperatures, and/or that the conductive paste must comprise metal particles present in a volume fraction above the percolation threshold. (Page 27, lines 2-12).

Rejection Under 35 U.S.C. § 103(a):

Claims 4-6, 11, 15, 19, 24-33, 35-36, 49-50, 54-58, and 60-63 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takenouchi in view of Lake (4,915,983).

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*. All words in a claim must be considered in judging the patentability of that claim against the prior art. *In re Wilson*. (MPEP § 2143.03). When evaluating the scope of a claim, every limitation in the claim must be considered. See e.g. *In re Ochtai*. (MPEP § 2144.08). The evidentiary record fails to teach each limitation of the present invention.

Specifically, as discussed above, Takenouchi is silent as to a conductive paste suitable to metallurgical bonding. Lake fails to complete Takenouchi because Lake is similarly silent.

Claims 22-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takenouchi in view of Arndt (3,601,523). Arndt was cited as providing a conductive paste

applied with a squeegee. Arndt does not provide the teachings of the present invention, missing from Takenouchi because Arndt merely teaches conductive paste bonding and is silent as to the composition of a conductive paste required to form metallurgical bonds.

Claims 34 and 59 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takenouchi in view of Dishon (4,921,157). Dishon is silent as to metallurgical bonding so therefore fails to complete Takenouchi.

Claims 37-44 and 69-78 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Takenouchi in view of Pepe (5,635,010). Pepe is silent as to metallurgical bonding so therefore fails to complete Takenouchi.

None of the art cited by the Examiner teaches metallurgical bonding. Moreover, none of the cited art teaches a conductive paste sufficient to form a metallurgical bond. Therefore, none of the cited art, whether taken severally or in any combination, anticipates or renders obvious the present invention.

Conclusion:

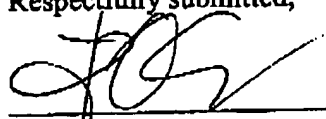
In view of the above, consideration and allowance are, therefore, respectfully solicited.

Accordingly, it is respectfully requested that the foregoing amendments be entered, that the application as so amended receive an examination on the merits, and that the claims as now presented receive an early allowance.

In the event the Examiner believes an interview might serve to advance the prosecution of this application in any way, the undersigned attorney is available at the telephone number noted below.

The Commissioner is hereby authorized to charge any fees or credit any overpayment associated with this communication, including any extension fees or fees for the net addition of claims, to Deposit Account No. 22-0185.

Respectfully submitted,



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